

## ORGANIC CHEMISTRY

**Lecturer:** Mas Imura, PhD

**Office:** Bech 1920 **Phone:** (707) 521-7852

**E-mail:** [miimura@santarosa.edu](mailto:miimura@santarosa.edu)

**Office Hours:** M: 9:50am~10:50am (at MESA); 11:00am~11:55am

T: 10:30am~11:40am

Th: 11:00am~12:00pm

**OVERVIEW:**

Welcome to CHEM 12B –2<sup>nd</sup> semester Organic Chemistry! I am passionate about organic chemistry! I truly hope that you find this course stimulating, challenging (in a good way), and rewarding, and that you find it as enjoyable as I do teaching this subject.

As the science that describes matter and its changes, chemistry is central in our understanding of many fields, from health to the environment to the design and evaluation of materials. The fact that all of biology and manufacturing deal with matter guarantees that chemical science will remain central to much of the human endeavor. Knowledge of organic chemistry is an essential foundation for your chosen discipline (chemistry, medicinal science, material science, engineering, pharmaceutical science, medicine, etc.)

CHEM 12A~12B is a demanding year-long organic chemistry course. Lecture topics in CHEM 12B, the 2nd semester Organic Chemistry, include:

1. Alcohols, Ethers, Epoxides and Related Sulfur COmpounds
  2. Aldehydes and Ketones
  3. Enols and Enolates
  4. Carboxylic Acids and Carboxylic Acid Derivatives
  5. Amines
  6. Aromatic Compounds, Aryl Halides and Phenols
  7. Heterocyclic Compounds
- And time permitting:
8. Carbohydrates
  9. Lipids
  10. Amino Acids
  11. Nucleic Acids

In the lab portion of the course, there will be a component of course-based undergraduate research experiences (CUREs). This is a unique opportunity for students in undergraduate level courses to participate in a faculty-supervised research project. Studies show that CUREs often serve to be a more inclusive entry point to scientific research than independent research experiences and improve the diversity of the scientific community.

**STUDENT LEARNING OUTCOMES (as stated in the official Course Outline of Record of SRJC.)**

**[https://portal.santarosa.edu/SRWeb/SR\\_CourseOutlines.aspx?Semester=20183&CVID=25155](https://portal.santarosa.edu/SRWeb/SR_CourseOutlines.aspx?Semester=20183&CVID=25155)**

Students will be able to:

1. Propose a synthetic route, predict the mechanisms for each step in the synthesis, and perform the synthesis and purification of a specified product from a list of given starting materials, while following common safety regulations and procedures.
2. Use nuclear magnetic resonance (NMR), infrared (IR), gas chromatography-mass spectrometry (GC-MS), and/or ultraviolet-visible data to elucidate the structures of unknown compounds and known compounds, and evaluate the success of the synthesis of a specific compound.

Objectives:

Upon successful completion of this course, the students will be able to:

1. Name a wide variety of organic compounds.
2. Predict and explain relative physical and chemical properties for a wide variety of organic molecules.
3. Predict the products and describe the mechanisms for a wide variety of organic compounds using fundamental chemical principles.
4. Effectively communicate observations and subsequent conclusions by means of written laboratory reports.

**GENERAL COURSE POLICY**

**I. Prerequisites:** Course Completion of CHEM 12A

**II. Lecture:** Bech Hall 1901, Tue and Thu 9:00AM~10:30AM

**Laboratory:** Section 4338 Bech Hall 1948, Tue and Thu 12:00PM ~ 3:00PM  
Section 4041, Bech Hall 1948, Tue and Thu 3:00PM ~ 6:00PM

### III. Course Materials:

#### REQUIRED:

- Textbook: Bruice, P. Y. *Organic Chemistry*, 8<sup>th</sup> Ed. Pearson Education, 2016.  
ISBN: 9780134042282 (Print)  
ISBN: 9270134066639 (digital subscription)
- Lab Manual: Pedersen, S.; Myers, A. *Understanding the Principles of Organic Chemistry: A Laboratory Course*, Cengage Learning, 2011  
ISBN: 9781111428167
- For lab: Protective eye wear and apron **must be used** in the laboratory **at all times** as required by California State law.

#### RECOMMENDED:

Molecular model kit. Any set would do.

Suggestions:

- Organic Model kits from the HGS-Maruzen Model company  
(<http://www.hgs-model.com/model/index.html>).
- Molymod Organic Student set  
(<http://www.molymod.com/sets.html>)

### IV. Attendance:

Attendance is **important and required** of all students. Attendance and attention are vital for your learning and success in this course. Please do not miss or be consistently late to the class. Excessive absences will result in a significant reduction in your course grade, and may lead to the student being dropped from the course completely. **THERE WILL BE NO MAKE-UPS ON LABS OR EXAMS FOR ANY REASON OTHER THAN A DOCUMENTED MEDICAL EXCUSE.**

**MISSING MORE THAN TWO LABS WILL RESULT IN AN "F" FOR THE ENTIRE COURSE, REGARDLESS OF THE STUDENT'S PERFORMANCE IN THE CLASS.**

**V. Standards of Conduct:** All students shall adhere to the District Standards of Conduct. Inappropriate behavior in the classroom may result in a referral to the Vice President of Student Services for disciplinary due process.

All students are expected to do their own work. This does not preclude collaboration and group study, but it does mean that anything put to paper and turned in is expected to come from that student. Cheating, or anything that can be construed as cheating will result in no credit given, if not worse. There will be no inter-student communication during exams; any comments or questions are to be directed toward the instructor.

## VI. Reading Assignments:

Lectures are designed to help you understand the material presented in the textbook. To get most out of the lecture, one should **ALWAYS** read the appropriate sections before they are discussed in class.

## VII. Homework Assignments:

Homework is an important vehicle for study; working out the problems is one of the most effective ways to learn and study chemistry. On occasion, the assigned problem may be the source of an exam question!

## VIII. Laboratory:

Laboratory exercises are an integral part of the course. They are designed to provide you with a hands-on way to experience the chemical concepts discussed in the lecture.

- Before lab, read the experiment and do all the pre-lab questions.
- Arrive on time, properly dressed.
- Follow all lab safety regulations discussed.
- Turn in your lab reports. Late labs will be marked down by 20% of the value of the lab reports.

**TO RECEIVE A PASSING GRADE IN THE COURSE, PASSING WORK MUST BE DONE IN BOTH THE LAB AND LECTURE PORTIONS.**

Attendance at laboratory sessions is mandatory. **PLEASE DO NOT MISS LABS.** No incomplete grades (I) will be given for missing labs. **In order to pass the course, no more than TWO (2) missing lab are allowed.**

At the beginning of the lab period, theoretical concepts, instructions, changes to the procedure, and safety precautions will be discussed. Your on-time attendance is required in order to safely and successfully perform the assigned laboratory experiment. A student who is tardy may be barred from the laboratory and receive a score of zero for that assignment.

You are expected to keep a Lab Notebook. The Lab Notebook is an extremely important part of any laboratory experience, since it is the permanent record of what was done and what was observed. Thus, you will be graded on the quality of maintenance of your Lab Notebook.

The format of the **reports** required for most of the experiments appears in a separate document. Unless you have talked to me in advance, missed or late reports will receive a score of zero, regardless of the actual experimental work performed.

## IX. Exams:

**NO MAKE-UP EXAMS WILL BE GIVEN IN THIS COURSE.** If an examination is missed, a score of zero will be recorded. Excused absence from an exam will be granted only if proper documentation is provided.

In the lecture portion of the course, there will be **3 exams and a final exam** (cumulative) in the course.

There will be **two lab exams** in this course. The lab exams will assess your knowledge and understanding of the chemistry and techniques of the performed experiments, as well as your awareness of safety procedures.

The dates of the exams and the final are provided below.

**X. Accommodations for Students with Disabilities:** If you need disability-related accommodations for the class, please provide the Authorization for Academic Accommodations (AAA letter) from the Disability Resources Department (DRD) to me as soon as possible. Also, please come see me during the office hour as soon as possible to discuss about the accommodations.

**XI. Re-Evaluation of Graded Work:** Graded work may be submitted for re-evaluation within one class period from when it was received. In comparing ones graded materials with that of fellow students, any difference must be confirmed by submission of both students' work for consideration. The document in question must be submitted with written detailed rationale for any changes requested. Based on this rationale, the entire assignment will be thoroughly evaluated. This re-evaluation can result in positive, negative, or no change to the original score.

**XII. Grading:** The weighing factors for the various types of assignments and percentage cutoffs are listed below:

Factors	Weights (%)
Lecture Exams	47 %
Homework	3 %
Lab Reports/Lab Notebook	21 %
CURE poster/report	14 %
Final Exams	15%

Final course letter grades will correspond to the following percentages:

100~87% **A**      86~78% **B**      77~ 63% **C**      62~ 50% **D**      Below 49% **F**

### **XIII. Emergency Evacuation Plan:**

In the event of an emergency during class that requires evacuation of the building, please leave the class or the lab immediately, but calmly. We will meet in the open area between Bech Hall, Shuhaw Hall, and Baker Hall to make sure everyone exited the building safely and to receive further instructions.

Copies of the red Emergency Preparedness Handbook are posted throughout the building and have more detailed information and procedures for most imaginable emergency situations. Any types of emergency can/should be reported to the district police dispatcher at (707) 527-1000.

### **XIV. Important Dates:**

Jan 21 <sup>st</sup> , 2018	Last day to register/add without instructor's signature or add code
Jan 28 <sup>th</sup> , 2018	Last day to drop semester length class (eligible for a refund)
Feb 4 <sup>th</sup> , 2018	Last day to register/add with the instructor's signature or add Code
Feb 4 <sup>th</sup> , 2018	Last day to drop a class without "W" symbol
FEB 15 <sup>th</sup> , 2018	Mandatory Professional Development Activity Institutional Day (No classes)
Feb 16 <sup>th</sup> , 2018	Lincoln's Day Holiday
Feb 19 <sup>th</sup> , 2018	Washington's Day Holiday
Feb 25 <sup>th</sup> , 2018	Last day to opt for P/NP
Mar 19~25, 2018	Spring Break
April 22 <sup>nd</sup> , 2017	Last day to drop a class with "W" symbol
May 19~25, 2018	Final Examinations

### **EXAM Dates:**

Feb 22 <sup>nd</sup> , 2018 (Thurs)	Exam #1 (during Lab)
April 10 <sup>th</sup> , 2018 (Tues)	Exam #2 (during Lab)
May 8 <sup>th</sup> , 2018 (Tues)	Exam #3 (during Lab)

**FINAL EXAM: May 24<sup>th</sup>, 2018 (Thurs) 7:00am~9:45 am**

**The Final Exam will be a comprehensive standardized final exam.**

## TENTATIVE COURSE SCHEDULE

<b>Week:</b>	<b>Tue</b>	<b>Thurs</b>
1		<b>Jan 18</b> Lecture: Chapter 10 Lab: 13C NMR/MS/Locker Check-in
2	<b>Jan 23</b> Lecture: Chapter 10 Lab: <b>Intro to CURE</b>	<b>Jan 25</b> Lecture: Chapter 10 Lab: <b>CURE</b>
3	<b>Jan 30</b> Lecture: Chapter 11 Lab: Expt 22 (Suzuki reaction)	<b>Feb 1</b> Lecture: Chapter 11 Lab: Expt 22 (Suzuki Reaction)/ <b>CURE</b>
4	<b>Feb 6</b> Lecture: Chapter 12 Lab: Free Radical Bromination (Handout)	<b>Feb 8</b> Lecture: Chapter 12 Lab: Free Radical Bromination (Handout)
5	<b>Feb 13</b> Lecture: Chapter 12 Lab: Expt 31 (Hydrolysis of a Nitrile)  <b>** Notebook Check #1**</b>	<b>Feb 15</b>  <b>NO CLASS – PDA day</b>
6	<b>Feb 20</b> Lecture: Chapter 15 Lab: Expt 31 (Hydrolysis of a Nitrile)	<b>Feb 22</b> Lecture: Chapter 15 Lab: <b>EXAM #1</b>
7	<b>Feb 27</b> Lecture: Chapter 15 Lab: Expt 13 (NaBH <sub>4</sub> reduction)/ <b>CURE</b>	<b>Mar 1</b> Lecture: Chapter 15 Lab: Expt 13 (NaBH <sub>4</sub> reduction)/ <b>CURE</b>
8	<b>Mar 6</b> Lecture: Chapter 16 Lab: Expt 14 (Grignard)	<b>Mar 8</b> Lecture: Chapter 16 Lab: Expt 14 (Grignard)
9	<b>Mar 13</b> Lecture: Chapter 16 Lab: Microwave Expt (tba)	<b>Mar 15</b> Lecture: Chapter 16 Lab: Microwave Expt (tba)

10	<b>Mar 20</b> <b>SPRING BREAK</b>	<b>Mar 22</b>
11	<b>Mar 27</b> Lecture: Chapter 17 Lab: <b>CURE</b>	<b>Mar 29</b> Lecture: Chapter 17 Lab: <b>CURE</b>
12	<b>Apr 3</b> Lecture: Chapter 17 Lab: Expt 28 (Rxn of Ester) or <b>CURE</b>	<b>Apr 5</b> Lecture: Chapter 17 Lab: Expt 28 (Rxn of Ester) or <b>CURE</b>
13	<b>Apr 10</b> Lecture: Chapter 8 Lab: <b>EXAM #2</b>  <b>** Notebook Check #2**</b>	<b>Apr 12</b> Lecture: Chapter 8 Lab: <b>CURE</b>
14	<b>Apr 17</b> Lecture: Chapter 8 Lab: Expt 26 (Diels-Alder)	<b>Apr 19</b> Lecture: Chapter 18 Lab: Expt 26 (Diels-Alder)
15	<b>Apr 24</b> Lecture: Chapter 18 Lab: Expt 18 (Friedel-Crafts)	<b>Apr 26</b> Lecture: Chapter 18 Lab: Expt 18 (Friedel-Crafts)
16	<b>May 1</b> Lecture: Chapter 18 Lab: Lab Practical or <b>CURE</b>	<b>May 3</b> Lecture: Chapter 18 Lab: <b>Working on Poster</b>
17	<b>May 8</b> Lecture: Chapter 22 Lab: <b>Exam #3</b>	<b>May 10</b> Lecture: Chapter 22 Lab: CURE wrap-up
17	<b>May 15</b> Lecture: tbd Lab: CURE wrap-up <b>**Notebook Check #3**</b>	<b>May 17</b> Lecture: Final Exam Review Lab: Locker Check-out

### FINAL EXAM (cumulative):

**May 24<sup>th</sup>, 2018 (Thurs) 7:00 am ~ 9:45 am**

**The Final Exam will be a comprehensive standardized final exam.**